Biosolids Management Plans

Water Environment Short School 2017

Oregon

Department of Environmental Quality

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This presentation will provide you with an understanding of:

- DEQ's Regulatory Program and Policy
- The Public Notice Process and when to update your Biosolids Management Plan
- Requirements for an approved Biosolids Management Plan
- Elements of a Biosolids Management Plan

Regulatory Programs

- Oregon Administrative Rule (OAR) Chapter 340 Division 50 covers the treatment, monitoring and land application of Biosolids in Oregon
- The Federal Code of Regulation (CFR) Part 503 covers the treatment, monitoring and land application of Biosolids across the US
- Oregon Department of Agriculture, “Class A EQ” bagged labeled products with guaranteed analysis

What is Regulated under your Biosolids Management Plan

- Biosolids Pollutants and some Nutrients
- Biosolids Pathogens and Vector Attraction Reduction
- Public Participation
- Biosolids Agronomic Loading
- Site Management and Access Restrictions
- Crop Harvest Restrictions
- Reporting and Recordkeeping

State of Oregon's Biosolids Policy

"…encourages the land application of treated domestic wastewater Biosolids, Biosolids derived products, and domestic septage which are managed in a manner which protects the public health and maintains or improves environmental quality."

Who needs a Biosolids Management Plan

Any person who intends on generating and/or land applying biosolids or domestic septage must submit a Biosolids Management Plan to the Department for review and approved at least 60 days prior to land application of biosolid (OAR 340-050-0031(1).

When to Update Your Plan Public Notice Process

- **During the issuance or renewal of a NPDES or WPCF permit** best time update your Biosolids Management Plan.
- **Public notice process,** the public must have an opportunity to review and comment on the plan, including all land application sites.
- If you have **major changes in your solids process** that affects the nature or quality of your biosolid then the Biosolid Management Plans must go out on Public Notice .
- **A land application plan** must be included in your Biosolid Management Plan if land application of biosolids occurs during the term of the permit. Biosolids site authorizations contain site specific land application plan conditions.
- **Public Participation** is required by the permittee when and where new land application sites are proposed.

Biosolids Management Plan Template

- **The Biosolids management plan template is available for your use**.
- **Required information** that is provided will delay your application process for obtaining plan approval.
- **Each facility plan should tailored** to the specifics of your wastewater treatment facility operations, and your Biosolids management and land application program**.**
- **All management plans** must be reviewed by the DEQ. Prior to department approval, the Biosolids management plan and land application plan must go through the public notice process.

Biosolids Management Plan

- **Water Quality Permit**: National Pollutant Discharge Elimination System (NPDES) or a Water Pollution Control Facility (WPCF) permit.
- **Biosolids Management and Land Application Plan:** DEQ review and approves all Biosolids Management Plans. All plans must go out on public notice prior to approval by DEQ.
- **Site Authorizations to Beneficially Land Apply Biosolids:** State of Oregon's Biosolids regulations cover beneficial land application which require a DEQ site review, public participation and a written DEQ authorization for each site.

Elements of a Biosolids Management Plan

- Facility Description, Wastewater Treatment process and Design Flow
- Biosolids Pathogen Reduction Process
- Biosolids Process for Vector Attraction Reduction
- Biosolids Characteristics, Sampling and Analysis
- Beneficial Land Application Sites and Farm Plan
- Process Contingencies
- Storage
- Reporting and Recordkeeping
- Certification Statement
- Public Notice process, Public Participation

Facility Description

Liquid Processing

- **Liquid Processing:** Liquids processing components, includi the number of components and the volume of each unit, and t current operating capacity. A diagram should also be include
- **Upgrades or modifications** made to the sludge process since the facility's previously approved biosolids management plan should be noted in your revised BMP during permit renewal process.
- **Fluctuations in flow and loadings**
- **Changes in mode of operation during seasonal conditions**
- **Process monitoring units**

Facility Description

Solids Processing

- **Solids Processing : primary, secondary, and tertiary solids processing components**
- **Operational information of component**
- **Operational controls for odor minimization**
- **End product and volume resulting from process**
- **Upgrades or modifications made to the process**
- **Solids processing operational changes during seasonal conditions**
- **Solids process monitoring**

Facility Description
Septage

- **Septage Processing:** **Note: This section should describe septage processing and address the following.*
- **Type of septage** received (e.g., septic tank, holding tank, chemical toilet).
- **Gallons received each year**.
- **Receiving and processing components**, including the volume of each component.
- **Septage processing** operational changes during seasonal conditions or fluctuations in flow.
- **Septage process monitoring** (e.g., flow measurement, screening, pH readings).

Facility Description Pretreatment

- **Pretreatment Program:** The **permittee is/is not** required at this time to implement an industrial wastewater pretreatment program (**state reason)**.
- Pollutant monitoring requirements as stated in the permit will ensure land application of biosolids occurs within federal and state pollutant limitations.

Biosolids Treatment Processes

- **Under 40 CFR Part 503 and Oregon Administrative Rules Chapter 340, Division 50, pathogen reduction and vector attraction reduction for biosolids must be met prior to land application**.
- **Biosolids are categorized as Class A or Class B**
- **Biosolids may also be classified as exceptional quality (EQ)**
- Some Class A materials should have **cautionary factsheets** for users.

Biosolids Pathogen Reduction Class A

- ***Class A Pathogen Requirements :*** **Note: Must meet the requirement for fecal coliform or Salmonella sp. and one of the 6 Class A alternatives.*
- Either the density of fecal coliform in the biosolids must be less than 1,000 MPN per gram total solids (dry weight basis), or the density of *Salmonella* sp. bacteria in the biosolids must be less than 3 MPN per 4 grams of total solids (dry weight basis).
- Sampling must consists of at least seven (7) discrete samples taken over a two week period, unless otherwise specified in the permit.

Biosolids Pathogen Reduction Class A Alternatives

- **Alternative 1: Thermally treated biosolids**
- **Alternative 2: Biosolids must meet specific high pH-high temperature, and air-drying**
- **Alternative 3: Demonstrate that biosolids treated in other processes** (that don't meet Alternatives 1 and 2) can reduce enteric viruses and viable helminth ova, and maintain operating conditions used to demonstrate pathogen reduction
  Alternative 4: Biosolids treated in unknown processes
- **Alternative 5: Biosolids shall be treated in one of the Process to Further Reduce Pathogens** (PFRP).
- **Alternative 6:** Biosolids shall be **treated in a process that is equivalent to a PFRP**, as determined by the permitting authority.

Biosolids Pathogen Reduction Class A PFRP

PFRP Listed in Appendix B of 40 CFR Part 503

- **Composting:**.
- **Heat Drying:**
- **Heat Treatment:**
- **Thermophilic Aerobic Digestion:**
- **Beta Ray Irradiation:**
- **Gamma Ray Irradiation:**
- **Pasteurization:**

Biosolids Pathogen Reduction Class B

- **The permittee must certify in writing that Class B pathogen and vector attraction reduction requirements are met:**
- **Alternative 1:** The **geometric mean of the density of fecal coliform of seven representative samples** shall be less than either 2 million Most Probable Number (MPN) or 2 million Colony Forming Units (CFU) per gram of total solids (dry weight basis).
- **Alternative 2:** Biosolids shall be **treated in one of the Processes to Significantly Reduce Pathogens** (PSRP) described in the table below.
- **Alternative 3:** Biosolids shall be **treated in a process that is equivalent to a PSRP**, as determined by the permitting authority.

Biosolids Pathogen Reduction Class B

Processes to Significantly Reduce Pathogens

- **Aerobic Digestion**
- **Air Drying**
- **Anaerobic Digestion**
- **Composting**
- **Lime Stabilization**

Vector Attraction Reduction Options

Vector Attraction Reduction requirements of 40 CFR Part 503 are met through the treatment process which includes supporting data within the biosolids management plan and annual report.

- **Option 1 503.33(b)(1) At least 38% reduction in volatile solids**
- **Option 2 503.33(b)(2) Less than 17% additional volatile solids loss during bench-scale** anaerobic batch digestion
- **Option 3 503.33(b)(3) Less than 15% additional volatile solids reduction during bench-scale** aerobic batch digestion
- **Option 4 503.33(b)(4) SOUR at 20°C (68°F) is ≤ 1.5 mg oxygen/hr/g total sewage sludge solids** (sample <2%TS).

Vector Attraction Reduction Options

- **Option 5 503.33(b)(5) Aerobic treatment of the sewage sludge for at least 14 days** at over 40ºC (104ºF)
- **Option 6 503.33(b)(6) Addition of sufficient alkali to raise the pH to at least 12 at 25ºC** (77ºF)
- **Option 7 503.33(b)(7) Percent solids ≥ 75% prior to mixing with other materials**.
- **Option 8 503.33(b)(8) Percent solids ≥ 90% prior to mixing with other materials**.)
- **Option 9 503.33(b)(9) Sewage sludge is injected into soil** so that no significant amount of sewage sludge is present on the land surface 1 hour after injection,
- **Option 10 503.33(b)(10) Sewage sludge is incorporated into the soil** within 6 hours after application to land or placement on a surface disposal site,

Biosolids Sampling and Analysis

- **Monitoring and Sampling Program**
- **Sampling locations**
- **How samples will samples be collected, preserved and transported, and**
- **The analytical method for each compound analyzed.**
- **All monitoring and reporting will be conducted in accordance with the permittee's NPDES/WPCF permit.**

Biosolids Characteristics

Pollutants:

Minimum of 9 metals reported on a dry weight (mg/Kg)

Arsenic (As), Cadmium (Cd), Copper (Cu), Lead (Pb), Mercury (Hg), Molybdenum (Mo), Nickel (Ni), Selenium (Se), Zinc (Zn)

Nutrients:

- Nitrogen (Ammonia -Nitrogen, Nitrate -Nitrogen, Total Kjeldahl -Nitrogen)
- Phosphorus
- Potassium

Other parameters :

- pH
- % Total Solids
- % Volatile Solids

Biosolids Land Application

Class B biosolids are required to be land applied to a site at a rate that is equal to or less than the agronomic rate for the crop grown at the site.

Agronomic loading rate is the whole biosolids application rate (dry weight basis) designed to provide the annual total amount of nitrogen needed along with any other supplemental nitrogen used by a crop in a growing season.

Biosolids Land Application

Your Biosolid Management Plan should have a Site Inventory of Existing and Potential Sites in the counties you plan to land apply:

Staging and Storage

- **Treatment Facility**
- **Staging**
- **Field**
- **Authorization letter (Land Use Compatibility Statement?**

Biosolids Transportation

- **Spill During Transportation of Biosolids**
- **Contain the spill.**
- **Post the area** and set up temporary fencing if there is a potential for public exposure.
- **Remove spilled biosolids** with a front end loader or shovel.
- Cover the area with dry lime if needed .
- Apply absorbent (e.g., sand) if needed specify when according to quantity and location.
- **Transport spilled product to a Department authorized biosolids land application or disposal site.**
- **All spills into waters of the state or spills on the ground surface that are likely to enter waters of the state will be reported immediately to Oregon Emergency Response System (OERS) at 1-800-452-0311 and the Department's regional biosolids specialist** . All spills of 25 gallons or more on the ground surface will be reported to the Department's regional biosolids specialist within 24 hour(s) of the spill incident.

Process Contingencies
Process upsets

Solids Treatment Process Failure

If a mechanical problem occurs with treatment component and replacement parts are not in stock at the treatment facility, and an emergency part must be ordered. During this down period, discuss the options available to your treatment processes to accommodate failure (e.g., divert waste activated sludge to another wastewater treatment facility, divert all sludge to a holding tank).

Reporting and Recordkeeping

Recordkeeping and Reporting Procedures

The permittee as the preparer and land applier of biosolids is required to maintain records to demonstrate that federal and state biosolids requirements are met. Monitoring and sampling records will be retained for a period no less than 5 years, unless otherwise required by the NPDES/WPCF permit or a site authorization letter.

- **Pollutant concentrations of each parameter stated in the permit. Pathogen requirements as stated in the permit for Class A/B.**
- **Description of how one of the vector attraction reduction requirements**
- **Description of how the management practices and site restrictions are met for each biosolids land application site.**
- **Certification that the information submitted is accurate to determine compliance with pathogen and vector attraction reduction requirements, and agronomic loading requirements.**

Certification Statement

- **The permittee is capable of meeting Class A/ B pathogen reduction and vector attraction reduction requirements.** As required under 40 CFR §503.17, the **permittee** must retain a certification statement indicating whether compliance with pathogen reduction, vector attraction reduction, and certain site restrictions have been met.
- **The certification statement must be retained for a period of five years, and must be submitted with the annual report that is due February 19th or as required by the permit.**
- The **permittee** will retain the following certification statement and it will be signed by a principal executive officer or ranking elected official or their duly authorized representative.

Pathogen and Vector Attraction Reduction Certifications

"I certify, under penalty of law, that the information that will be used to determine compliance with the Class B pathogen requirements in 40 CFR §503.32(b) **(insert either (2),(3), or (4))**, the vector attraction reduction requirement in 40 CFR §503.33(b) **(insert appropriate option (1) through (8))**, and the site restrictions in 40 CFR §503.32(b)(5) for each site on which Class B sewage sludge was applied, was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification, including the possibility of fine and imprisonment."

- **Signature**_____

  Date_____

Agronomic Certification

Permittee is also required as the land applier to certify that the management practices in 40 CFR §503.14 are being met. This certification includes that biosolids are being land applied at approved agronomic loading rates as specified in department issued site authorization letters.

- "I certify, under penalty of law that the management practices in 40 CFR §503.14 have been met for each site on which bulk biosolids is applied. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the management practices have been met. I am aware that there are significant penalties for false certification, including the possibility of fine and imprisonment."

- **Signature**_____
  Date_____

Farm Plan and New Biosolids Sites

- If necessary, the **permittee** will locate additional sites for land applying biosolids. Prior to using any site for land application, the **permittee** is required to receive a written site authorization letter from the Department. The following site conditions will be considere when determining the suitability of a site for land application:
- All sites will be located on **agricultural/forest/reclamation** land in **name of county or more defined area**.
- A site should be on a stable geologic formation not subject to flooding or excessive run-off from adjacent land.
- Minimum depth to permanent groundwater should be four feet **and the minimum depth to temporary groundwater should be one foot at the time when application of liquid biosolids occurs.**
- Topography should be suitable for normal agricultural operations. **Liquid biosolids should not be land applied on bare soils when the slope exceeds 12 percent. / Dewatered or dried biosolids may be land applied on well vegetated slopes up to 30 percent.**
- Soil should have a minimum rooting depth of 24 inches.

The End

Are there any Questions?

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